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A new species of *Samarangopus* (Myriapoda: Pauropoda) from Papua New Guinea

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Abstract – The class Pauropoda has been identified for the first time from Papua New Guinea. The material belongs to a new species in *Samarangopus*, *S. papuensis* sp. nov., of the family Eurypauropodidae. The Australian species *Eurypauropus speciosus* Harrison is transferred to the genus *Samarangopus*.

INTRODUCTION

The pauropod fauna of Australasia and surrounding islands is relatively uninvestigated and very few papers have been published. A few haphazard finds have been made from Java (Silvestri 1930), Borneo (Scheller 1994), Mindanao, Peleliu among the Palau Islands and Guam (Remy 1957), resulting in 12 species, which is probably only a small fraction of the real fauna.

Thanks to Dr W. F. Humphreys, Western Australian Museum, we are now able to add a pauropod to the New Guinean fauna, which he collected from Baiteta near Madang in equatorial northern Papua New Guinea. This specimen is found to belong to a new species in the genus *Samarangopus* (Eurypauropodidae). That genus is known earlier from some adjacent areas: Java (Silvestri 1930), Borneo (Scheller 1994), New Caledonia (Remy 1956b, Scheller 1993) and probably also from New South Wales as Harrison (1914) briefly described *Eurypauropus speciosus* from Lobster Beach, Broken Bay. The latter species is here tentatively transferred to *Samarangopus*: *S. speciosus* (Harrison), **comb. nov.**

Provisional list of the species of the genus *Samarangopus*:

Species	Localities	References
S. browni Remy	New Caledonia	Remy 1956b
S. doiinthanonaeus Scheller	Thailand	Scheller 1995
S. flabrarius Remy	Madagascar	Remy 1956a
S. jacobsoni (Silvestri)	Java	Silvestri 1930
S. molestus Remy	Mauritius	Remy 1959
	Réunion	Remy 1959
S. oxypygus Remy and Rollet	Madagascar	Remy and Rollet 1960
S. palearum Scheller	New Caledonia	Scheller 1993
S. papuensis sp. nov.	Papua New Guinea	This paper
S. poculifer Scheller	Thailand	Scheller 1995
S. saproxylophilus Remy	Madagascar	Remy 1956a
S. segniter Scheller	Borneo	Scheller 1994
S. spathaceus Scheller	New Caledonia	Scheller 1993
S. speciosus (Harrison)	Australia, New South Wales	Harrison 1914
S. umbonifer Scheller	Thailand	Scheller 1995
S. umbraculus Scheller	New Caledonia	Scheller 1993

In addition, Remy (1959) described *Samarangopus* sp. from Mauritius and Réunion.

Because the present author has studied several other species occurring in some collections from the Australasian region, the genus seems to be rich in species there. The above list probably enumerates a small fraction only of the species of the genus and therefore a useful key can not be constructed at present.

The abbreviations used below follow Hasenhütl (1986), and the sole specimen examined is lodged in the Western Australian Museum, Perth (WAM).

SYSTEMATICS

Family Eurypauropodidae Ryder

Subfamily Eurypauropodinae Verhoeff

Genus *Samarangopus* Verhoeff

Samarangopus Verhoeff, 1934: 189.

Diagnosis

An Eurypauropodinae genus with 5-segmented legs with one main claw and one anterior secondary claw; antennal globulus short-stalked and the anterior margin of the sternal antennal branch shorter than posterior one; anterior antennal flagellum F_2 shorter than posterior one F_3.

Samarangopus papuensis sp. nov.
Figures 1–18

Type material

Holotype

Adult ♀, Baiteta, Madang Province, Papua New

Guinea, 5°00'37"S, 145°46'08"E, lowland rain forest, Tullgren funnel litter extraction, 9 May 1990, W. F. Humphreys (WAM 95/767, PNG 1990:833).

Description

Adult female (holotype)

Length. 0.65 mm.

Head. Head setae only partly distinguishable. Setae cylindrical, annulate. Vertex: not studied. Tempus: only one seta, l ≈ 10 µm. Frons: no frontal pores; no pistil; ?frontal verruca. Index of frontal setae: median row, *mp* = 16; lateral row, four setae, lp_1 = 13, lp_2 = 16, lp_3 = 10, lp_4 = 10, lp_2–lp_3 = 6, lp_1–lp_1 = 15. Temporal organ: l = 28 µm.

Antennae (Figure 2). Cuticle of basal antennal segments and branches glabrous, segments three and four almost glabrous. Chaetotaxy of segments 1–4: 2/2/2 + g'/3. Setae cylindrical, annulate, segment 1, p = 8, p' = 6; segment 2, p = p' = 9; segment 3, p = 8, p' = 10, g' very small, spherical; segment 4, p = 7, p' = 13, p'' = 9 µm, the setae p''', u and r absent. Sternal branch s, anterior margin = 10, posterior margin = 15, ø of base = 6.5, maximum ø = 8.5, q = 12 µm. Anterior margin/length of g = 1.1; anterior margin/length of q = 0.8; anterior margin/posterior margin = 0.7; anterior margin/maximum ø = 1.2; maximum ø/ø of base = 1.3. Globulus g, length = 9, ø = 6, ø of base = 2 µm; number of bracts ≈ 9, their length = 5–6 µm; capsule subspherical, ø = ± 3.5 µm. Tergal branch t fusiform, length = 16, ø of base = 5.5, maximum ø = 6 µm; pore not identified; length of t/maximum ø = 2.7. Relative lengths of flagella (base segments included): F_1 = 68 and 71, F_2 = 28, F_3 = 59. Base segments glabrous, their lengths: bs_1 = bs_3 = 11, bs_2 = 6 µm. The F_1 4.3–4.4 times as long as t, F_2 and F_3 1.9 and 3.9 times as long as s respectively. Calyces helmet-shaped, those of F_1 large, those of F_2 and F_3 smaller.

Trunk. Setae of collum segment (Figure 3) similar in shape and length, furcate; primary branch subcylindrical, tapering, pointed, striate; secondary one short, tapering, pointed, glabrous; lengths of setae = 7 µm; sternite process with short pubescence most anteriorly; appendages about as wide as long, glabrous, cap glabrous.

Tergite I with sublateral ridges which turn inwards anteriorly, tergites II–V with sublateral ridges, on VI two transverse ridges, a longer anterior one and a short posterior one (Figure 1). Tergites with three types of protuberances: (1) on anterior margin of tergite I, lateral margins of II–V and posterolateral margins of VI they are large wedge-shaped to campanulate with a distinct collar or they are reduced (Figures 4, 6, 8, 9, 12); (2) smaller fungiform ones with a disc-like round cap attached to a cylindrical but in distal part widened stalk (Figures 4–6, 8, 9, 12); (3) a great many more or less evenly distributed small cones projecting outwards under the cuticle (Figures 4–9, 12). Tergite I with 27 protuberances of the first mentioned type at anterior and anterolateral margins and several fungiform protuberances inside the anterior and lateral margins and on the ridges (Figures 4–6); tergite II with wedge-shaped and campanulate protuberances at lateral margins, those nearest to pit of T_1 rudimentary (Figure 8); fungiform ones inside these rows and on the ridges; posterior margin with irregular blunt teeth (Figure 7); tergites III–VI similar to II (Figure 13). Tergite VI with only one campanulate seta at each inner margin of the pit of T_5 (Figure 12).

Number and lengths of lateral wedge-shaped or campanulate protuberances (format according to Scheller 1993): I, no. 27 (anterior and lateral), lengths = 10–17; II, no. 1 (very small) – T_1 – 8 – 1 (small), lengths = 2–20; III, no. 1 (small) – 4/5 – T_2 – 1 (small) – 5 – 1 (small), lengths = 8–17; IV, no. 1 (very small) – 1 (small) – 4 – T_3 – 1 (small) – 4/5, lengths = 9–18; V, no. 1 (small) – 5 – T_4 – 1 (small) – 3, lengths = 9–17; VI, no. 6 (increasing in length posteriorly) – T_5 – 1, lengths = 8–15 µm. Length/width ratio of tergites: I = 0.5, II = III = IV = VI = 0.4, V = 0.5.

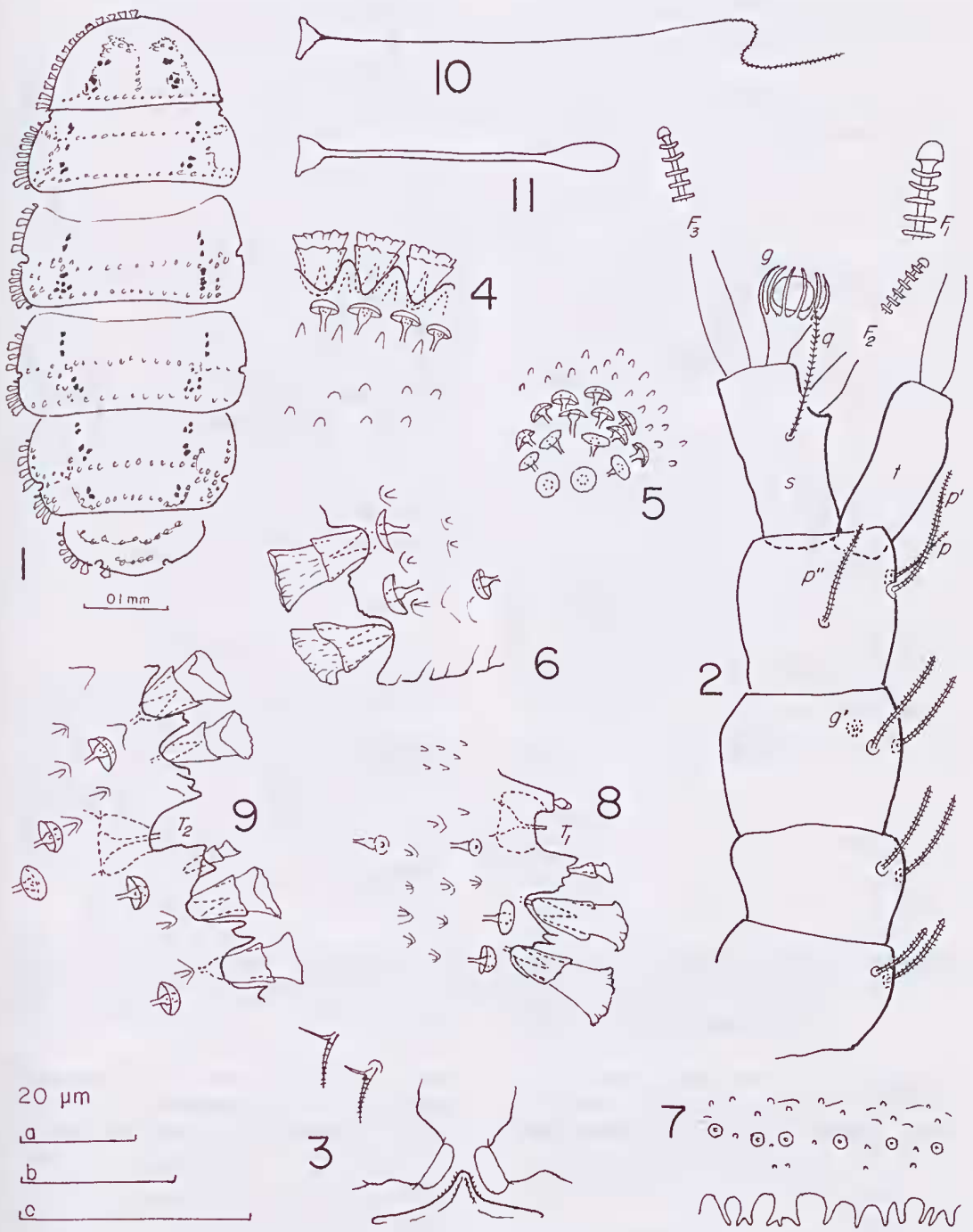
All trichobothria but T_3 with very thin axes, glabrous except for distal half which has erect minute pubescence; distal part curled up (Figure 10); T_3 with thicker axes and distal 1/4 forming clavate swelling (Figure 11). Length of trichobothria: T_1 = 77, T_2 = 80, T_3 = 42, T_4 ≈ 60, T_5 ≈ 55 µm. Ratio T_3/T_2 = 0.5.

Legs. Setae on coxa (Figure 17) and trochanter of leg 9 similar, furcate, branches thin, tapering, pointed, pubescent–striate; secondary branch only very little shorter than primary branch. More anteriorly the secondary branch is very short and glabrous.

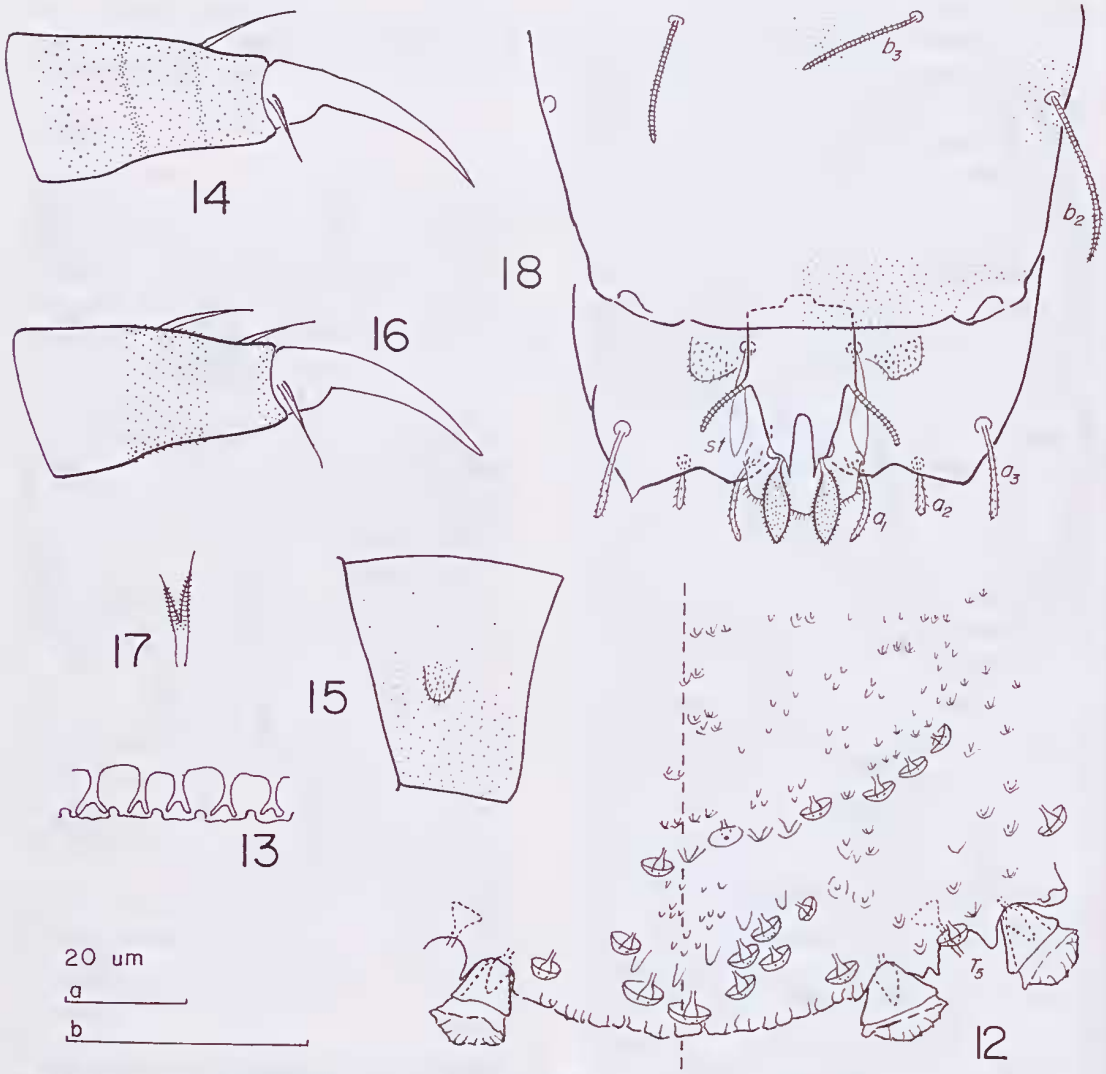
Tarsi tapering, those of leg 9 (Figure 16) 1.5 times as long as greatest diameter; two subsimilar tergal setae, both pointed, glabrous; length of proximal one = 8, distal one = 7 µm; proximal one 0.6 of the length of tarsus and 1.1 times as long as distal one.

Length of main claw in leg 1 = 20 µm, about as long as tarsus (Figure 14), secondary claw = 6 µm. One seta only on tarsi of leg 1. On anterior side of femur of leg 1 a small linguiform plate (Figure 15), length almost 0.2 of the length of femur; plate with dense short oblique pubescence. Cuticle of anterior legs minutely granular, that of the posterior legs shortly pubescent.

Pygidium (Figure 18). *Tergum.* On its sternal side between *st* a linguiform plate which protrudes backwards, its posterior triangular part extends as far as the posterolateral corners of the tergum; posterior margin with deep triangular depressions outside the linguiform plate. Setae a_1 cylindrical, curved inwards, with short pubescence; a_2 straight,



Figures 1–11 *Samarangopus papuensis* sp. nov., holotype, adult ♀: 1, Body with tergites I–VI, marginal protuberances drawn on left side only, black patches – tergite warts. 2, Right antenna, sternal view. 3, Collum segment, median and right part, sternal view. 4–7, Tergite I: 4, anterior margin with 3 large marginal protuberances; 5, anterior part of submedian hump; 6, left posterolateral corner; 7, posterior margin. 8, Tergite II, anterolateral part with insertion pit of *T1*. 9, Tergite III, lateral part with insertion pit of *T2*. 10, *T1*. 11, *T3*. Scale a: 4,5,6,7,8,9; b: 3,10,11; c: 2.



Figures 12–18 *Samarangopus papuensis* sp. nov., holotype, adult ♀: 12. Tergite VI, right half. 13, Tergite IV, posterior margin. 14, Tarsus of leg 1. 15, Femur of leg 1 with linguiform plate, right side, anterior view. 16, Tarsus of leg 9. 17, Seta on coxa of leg 9. 18, Pygidium, sternal view. (Pubescence only partly drawn in 16 and 18). Scale a: 12,13; b: 14,15,16,17,18.

somewhat clavate, with distinct pubescence; a_3 somewhat diverging, cylindrical, blunt, with oblique pubescence; *st* lanceolate, glabrous. Index of tergal setae: $a_1 = a_3 = 8$, $a_2 = 4.5$, a_1–$a_1 = 8.5$, a_2–$a_2 = 19$, a_3–$a_3 = 30$; *st* = 10, *st*–*st* = 9 µm; *st*–*st*/a_1–a_1 = 1.1, a_1/a_1–a_1 = 0.9, a_1/a_1–a_2 = 1.6, a_1–a_1/a_2–a_3 = 1.4. Cuticle glabrous.

Sternum. Posterior margin between b_1 almost straight; the b_1 of its posterolateral corners missing; b_2 and b_3 cylindrical, striate, curved somewhat inwards and diverging. Anal plate 1.4 times as long as broad, strongly tapering posteriorly; lateral margins with a pair of thin, diverging, cylindrical, striate branches which are 0.5 of the length of plate; posterior third divided lengthways by a narrow U-shaped incision into two tapering appendages with straight margins, ends of appendages with thorn-like prolongation of inner margins; posterior appendages with stalked bladders which are pointed distally and covered with a short but dense pubescence; bladders 3 times longer than wide, 0.5 of the length of plate.

Remarks

The genus *Samarangopus* has long been considered to be poor in species but collections in

later years with different types of automatic apparatus have yielded much material which has doubled the number of species from seven to fourteen (Scheller 1993, 1994, 1995). The genus does not seem to occur outside of the tropics where its known range includes Thailand and several islands from Madagascar to New Caledonia.

The new species may be most close to *S. umbonifer* Scheller (1995) from Thailand. These two species are generally alike and have specific characters which do not occur in other species, viz. the occurrence of a collar on at least some of the large protuberances of the tergites and the specific shape of the fungiform protuberances there. Good distinguishing characters are the morphology of the tergites II–V (with low sublateral ridges lengthways in *S. papuensis*, with many distinct depressions on each tergite in *S. umbonifer*, the shape of the large marginal protuberances of the tergites (more or less campanulate with square ends, not leaf-shaped), the shape of the sternal antennal branch *s* (wide and cylindrical, not distinctly narrower in distal part) and the shape of some setae (those on coxa and trochanter of leg 9 pointed, not cylindrical; pygidial a_3 cylindrical and blunt, not tapering and pointed).

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